

DEVELOPMENT OF A GIS TO ENHANCE NMFS'S SEA TURTLE TRACKING PROGRAM IN THE GULF OF MEXICO

by

MAURICE L. RENAUD, JO A. WILLIAMS and JAMES A. CARPENTER

Southeast Fisheries Science Center, National Marine Fisheries Service, Galveston
Laboratory, 4700 Avenue U, Galveston, TX 77551.

Since 1989, 50 Kemp's ridley (*Lepidochelys kempii*), 17 green (*Chelonia mydas*) and 6 loggerhead (*Caretta caretta*) sea turtles have been tracked using satellite, radio and sonic telemetry by the Galveston Laboratory of the National Marine Fisheries Service. These species are either endangered (Kemp's ridley and green) or threatened (loggerhead). The goal of our research is to characterize sea turtle habitats and movement patterns.

With inhouse technology, maps are produced with digitized shore lines, depth contours and offshore reefs. Locations of turtles, specific gas and petroleum structures, and other identifiable structures are overlaid onto the map. We have demonstrated seasonal habitat faithfulness of turtles to structures in the Gulf of Mexico, homing behavior by turtles displaced from their capture site, and delineated nursery grounds used by juvenile turtles. These data suggest that local weather systems effect turtle movement and diving behavior, and that abrupt changes in water temperature may initiate turtle movements. More recently, the use of AVHRR and AGIS have allowed us to add sea surface temperatures to these maps. This will improve considerably our analytical capabilities.

Turtles may move hundreds of kilometers over relatively short time periods. This raises important ecological questions. Are turtles maintaining a particular physical environment around them, i.e., certain temperature range? Do environmental factors hinder, aid or stimulate turtle migrations? For the most part, these questions will remain unanswered until site specific measurements become available through GIS data bases. Our interests lie in specific information at actual turtle locations, i.e., water current speed and direction, water depth, wind speed and direction, air and water temperatures, submerged vegetation (sea grass, sea weeds, baren), bottom types (mud flats, sand bottom), and quantifiable measures of biota (blue crab abundance).

Should be cited as:

Renaud, M., J. Williams, and J. Carpenter. 1994. Development of a GIS to enhance NMFS's sea turtle tracking program in the Gulf of Mexico. Abstracts of the Tenth Annual Workshop on Remote Sensing and Geographic Information Systems for coastal management in Louisiana. May 23-25, 1994, Louisiana State University, Baton Rouge, Louisiana, p.12.